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October 20, 1978

OCT 31 1978

TO: All Commissioners and Alternates
FROM: Charles R. Roberts, Executive Director

UNIVERSITY OF CALIFORNIA

SUBJECT: STAFF REPORT AND RECOMMENDATION ON PACIFIC GAS AND ELECTRIC
COMPANY'S NOTICE OF INTENTION TO CONSTRUCT A 1600 MW COMBINED CYCLE
ELECTRIC GENERATING PLANT AT PITTSBURG (PITTSBURG 8 & 9).
(For Commission Consideration on November 2, 1978 and Voting on
November 16, 1978)

*Pacific gas & electric co
Elec. power - plants - Envtl.
aspects - can
wetland cons. - Both - Pittsburg
can - SF Bay area*

Summary

This is the second Notice of Intention (NOI) for a major power plant proposed by the Pacific Gas and Electric Company (PG&E) that BCDC is required to review under Section 66645 of the Government Code. Specifically, BCDC is required to determine whether the proposed power plant is consistent with the Bay Plan and the McAteer-Petris Act, and if it is not, to determine what modifications to the project can be made to make it consistent. Those determinations will then be submitted to the Energy Commission.

PG&E is now proposing a 1600 megawatts (mw) combined cycle power plant at the western end of its 3-mile-long, waterfront site at Pittsburg; the eastern end of which is now occupied by the existing Pittsburg Units 1 through 7. The proposed power plant would be located partially within BCDC's jurisdiction in an area reserved for water-related industrial priority uses in the Bay Plan. A significant portion of the site on which the power plant is to be located is marsh. This report summarizes the issues involved in that power plant proposal and recommends findings for Commission adoption.

The report is divided into two major sections. The first section, the Background Report, briefly describes the proposed project and site and discusses the relevant sections of the Bay Plan and the McAteer-Petris Act. The second section contains the staff recommended findings which are based on the Background Report.

It should be noted that this report is independent of the study being conducted to designate those areas of BCDC's jurisdiction that are not suitable for power plants, but, unlike the Collinsville proposal for Fossil 1 and 2, BCDC can designate this site as unsuitable in that study.

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A summary of the recommendation follows:

1. The proposed power plant is inconsistent with the Bay Plan and the McAtteer-Petris Act because:

a. The site is reserved for water-related industry in the Bay Plan and this power plant is not a water-related industrial use.

b. Portions of the site where the plant would be located are marsh. The marsh policies of the Bay Plan require a showing that there are no reasonable alternatives to filling marshes. PG&E has not submitted information demonstrating that there is no alternative to filling marshes for a power plant.

c. In addition to the use inconsistency and the lack of support for filling marshes for a power plant, the project also is inconsistent with those policies of the McAtteer-Petris Act and the Bay Plan which require that there be no alternative upland location for the project, that any fill is the minimum necessary for the project, and that the location and extent of any fill is such that it will minimize harmful effects to the fertility of marshes and to fish and wildlife resources. PG&E has not submitted sufficient information to show how the project complies with these policies, especially information on the lack of alternative upland locations for the power plant, alternatives in plant design and siting at this site which would reduce or eliminate the amount of fill within the Commission's "bay" jurisdiction or a mitigation plan showing how unavoidable adverse effects will be offset by corresponding environmental benefits. Therefore the project has not been shown to comply with the policies of the Act or Plan.

d. Under the McAtteer-Petris Act and the Bay Plan, maximum feasible public access must be provided and development should be clustered to preserve views. PG&E has not submitted any information on providing public access, nor has it submitted any information on why the plant is proposed two miles west of the existing power plant at Pittsburg. Thus, compliance with these policies has not been demonstrated.

2. The power plant cannot be modified to make it consistent with the McAtteer-Petris Act and the Bay Plan because it is a use of this site that is inconsistent with the provisions of the Bay Plan.

Staff Recommendation

The staff recommends that the Commission: (1) hold a public hearing on the report at its regularly scheduled meeting of November 2, 1978, and close the hearing after testimony has been received; and (2) schedule a vote on the report at its regularly scheduled meeting of November 16, 1978.

I. BACKGROUND REPORT

A. Project Background

1. Project Description. Pittsburg 8 and 9 is a proposed combined cycle, electric generating plant consisting of two 800 mw units. The plant is located at the western end of a PG&E-owned site that has about 3 miles of Bay frontage just east of the City of Pittsburg in Contra Costa County. The eastern end of the site contains the existing Pittsburg Units 1 through 7 and the westernmost boundary of the property extends to the McAvoy Harbor (Exhibit 1). The generating units, fuel storage tanks, water treatment plant, and the cooling towers for the proposed plant will cover about 200 acres (Exhibit 2). The cooling towers and fuel storage tanks are to be located on a diked-off evaporation pond; the generating units are proposed on an area that is partially tidal marsh, and is now used for grazing cattle.

A combined cycle generating plant consists of a gas turbine followed by a steam turbine operating off the hot exhaust gasses from the gas turbine. The fuel costs of such a plant are higher because the gas turbines require distillate oil, but the efficiency of the unit is higher because the exhaust gasses from the gas turbine are used to power a steam generating unit rather than vented to the atmosphere and wasted.

Fuel for the proposed power plant would be offloaded at the existing marine terminal facilities for the existing power plants at Pittsburg and transported by pipeline to the proposed location of Units 8 and 9.

The cooling system for the power plants will use evaporative mechanical cooling towers drawing water from the confluence of the Sacramento River and Suisun Bay. PG&E is proposing to locate the intake structure for the cooling system in the Harris Yacht Harbor Slough, but notes that the intake structure could be located directly on the Bay if future studies determine that that location is more desirable. The quantity of water drawn from the Bay for the cooling system is about 40 cubic feet-second and about 27 cubic feet-second of blowdown will be discharged to the Bay.

The renderings and a rough plant layout are shown in Exhibits 2 and 3. Some changes to the design have been made. The height of the stacks has been reduced to 125 feet, and, because the water treatment plant was relocated south of the plant site, the exact configuration of the facilities at that end of the site is not known.

2. Site Description. As shown on Exhibit 6, the site is roughly split into four quadrants. Stake Point, the easternmost edge of BCDC's "bay" jurisdiction over the water, is about 300 feet east of the center of the site. The northern portion of the site, where the discharge conduits for the cooling system will be located, is tidal marsh. The southern portion of the site is roughly bisected by tidal marsh that runs almost to the southern

property line. To the east of that portion of the marsh is a diked-off pond that has been used as an evaporation pond by nearby industry. The cooling towers and fuel storage tanks would be located on the evaporation pond.

To the west of the marsh that bisects the southern portion of the site is an area that was diked off at some time in the distant past, but the dikes have long since fallen into disrepair. The northernmost portion of the dike is now only a slight elevation to the ground, so the tide flows into the area that was once diked off. This area contains several species of marsh vegetation at the lower elevations. The marsh vegetation is gradually replaced with upland grasses toward the southern part of the site. Cattle have been grazed on the site. The power generating units, water treatment plant, switchyard, and administration facilities would be located on this western portion of the site. A road and several pipelines connect the generating units with the cooling towers and fuel storage tanks, traversing the marsh that bisects the southern portion of the site.

3. Alternative Sites. No alternative sites, either within the boundaries of the PG&E property at Pittsburg or at different locations have been proposed or evaluated in the NOI. The Warren-Alquist Energy Resources Conservation and Development Act (Warren-Alquist Act) provides that the NOI is "not required to contain three alternative sites...on land owned by an electric utility...near the City of Pittsburg." (Public Resources Code Section 25502.5.) PG&E has apparently taken the position that that section permits them to avoid considering alternative locations for the plant on their 3-mile-long property at Pittsburg as well as other locations.

4. BCDC Jurisdiction. Based upon a misinterpretation of the McAteer-Petris Act, PG&E has asserted that BCDC's jurisdiction over this project only extends to marsh identified in the NOI and thus over only the intake and discharge conduits for the cooling system, a small portion of one of the generating units and some ancillary pipelines and fill (Exhibit 5). However, BCDC's "bay" jurisdiction is derived from Government Code Section 66610(a) which provides:

(a) San Francisco Bay, being all areas that are subject to tidal action from the south end of the bay to the Golden Gate (Point Bonita-Point Lobos) and to the Sacramento River line (a line between Stake Point and Simmons Point, extended northeasterly to the mouth of Marshall Cut), including all sloughs, and specifically, the marshlands lying between mean high tide and five feet above mean sea level; tidelands (land lying between mean high tide and mean low tide); and submerged lands (land lying below mean low tide.)

BCDC's regulations further explain "bay" jurisdiction. Section 10132 of Title 14, California Administrative Code, states that "bay" jurisdiction consists of all areas that have been touched by tidal waters at any stage of the tide at any time on or subsequent to the effective date of the McAteer-Petris Act (September 17, 1965). Thus, BCDC's "bay" jurisdiction includes all areas bayward of the line of highest tidal action since 1965, and also includes all

marshlands between mean high tide and the five-foot contour line. In the past, the BCDC staff has estimated the line of highest tidal action on nearby parcels at 5.89 feet (using 1929 USGS mean sea level as the datum). Recent review by the staff (Exhibit 7) indicates that the estimated line of highest tidal action on this site should be 5.5 feet (compared to PG&E's interpretation of BCDC's jurisdiction at between 2.5 and 3 feet). With BCDC's "bay" jurisdiction extending to 5.5 feet and BCDC's shoreline band jurisdiction extending inland another 100 feet, BCDC's jurisdiction extends over most of Unit 9 and a significant portion of Unit 8 as well (Exhibit 5).

It should be pointed out that BCDC has never had occasion to interpret the language in the McAteer-Petris Act that defines the easterly boundary of the Commission's jurisdiction (as opposed to the southerly or inland boundary discussed above). Specifically, the easterly boundary of the Commission's "bay" jurisdiction over the water is defined as a line drawn across the Bay between Stake and Simmons Points. However, the Act does not specify what happens to the eastern boundary inland of Stake Point. Bay Plan Map 17 indicates that the easterly boundary covers the contiguous marshlands eastward of Stake Point to the next channel. However, the maps are not determinative of BCDC's jurisdiction, and a proposed regulation will be presented to the Commission in the near future to define more precisely the eastern boundary inland of Stake Point. A precise definition of that eastern boundary is not necessary at this time, however, because most of the plant is west of Stake Point and clearly within BCDC's "bay" jurisdiction.

B. Bay Plan Policies and Project Impacts

1. Water-Related Industry Priority Use Areas. The proposed location for the power plant is within an area designated on the Bay Plan as a priority use area for water-related industry. The Bay Plan states that land reserved for water-related industries should only be used by industries that require waterfront sites for extensive shipping by water (Bay Plan Water-Related Industry Policy No. 3, page 18). Both the Bay Plan and the McAteer-Petris Act make a clear distinction between power plants that require large amounts of water for cooling and water-related industries. The Bay Plan notes that both types of uses compete for waterfront sites (Bay Plan Water-Related Industry Finding d, page 17), but concludes that: "Land reserved for water-related industries should ultimately be used only by industries specifically requiring waterfront sites for extensive shipping by water. (Water-using industries...should be located outside of the area reserved for water-related industry....)" (Bay Plan Water-Related Industry Policy No. 3, page 18.)

The proposed power plant does not require this waterfront site for extensive shipping by water. No marine terminal facilities are proposed. Fuel will be brought in through the existing marine terminal two miles away at the existing Pittsburg power plant and transported to the site by pipeline. Thus, the distinction between water-using and water-related industries established in the Bay Plan and the McAteer-Petris Act applies, and locating the power plant on this site would be inconsistent with both the Act and the Plan.

2. Biological Resources of the Site

a. Marsh. The Bay Plan states: "...marshes...should be maintained to the fullest possible extent...Filling and diking that eliminate marshes...should therefore be allowed only for purposes providing substantial public benefits and only if there is no reasonable alternative." (Bay Plan Marshes and Mudflats Policy No. 1, page 11). The extent of tidal marsh in western portion of the site where the generating units would be located on the site is subject to some dispute. PG&E consultants call this portion of the marsh "impounded marsh" because the remnants of the dike prevent tidal waters from reaching south all of the time. PG&E's estimate of the extent of this tidal marsh is shown on Exhibit 6 and roughly follows the three-foot contour line. BCDC staff survey of the site indicates that several species of plants that are characteristic of the higher elevations of salt marshes are found at areas roughly corresponding to the five-foot contour line (Exhibit 6). Marsh vegetation such as pickleweed and brass buttons extend further upland in progressively lesser numbers, and the Energy Commission's staff biologist found such vegetation as high as the eight-foot contour line.

There is no disagreement, however, that some marsh within BCDC's jurisdiction will be filled by this proposed project. PG&E estimates that about 2.9 acres of tidal marsh outside of any dikes will be filled (all in BCDC jurisdiction) and that about 5.5 acres of "impounded marsh" will be filled on the western portion of the site. BCDC staff estimates of marsh on the western portion of the site that would be filled are greater and would be about 20 acres (Exhibit 6).

Before any marsh can be filled under Bay Plan policies, it must be demonstrated that there are no reasonable alternatives to the fill. PG&E has submitted no information about alternatives to the proposed fill.

b. Bay Jurisdiction and Other Wildlife Resources. Regardless of whether "marsh" exists to about the three-foot contour (as contended by PG&E), or to about the five-foot contour (as determined by the BCDC staff), important wildlife resources and the "bay" jurisdiction of BCDC extend at least to the 5.5-foot contour line. Section 66605 of the McAteer-Petris Act provides that fill can be permitted within the "bay" jurisdiction of BCDC only if there are no alternative upland locations for the project, the fill is the minimum necessary, and the fill minimizes harmful effects to wildlife resources (Government Code Sections 66605(b), (c), and (d)). Between those areas that are clearly "marsh" and the upland grasslands that are above the line of highest tidal action are important transitional areas that contain both marsh and upland vegetative characteristics. A greater diversity of plant species occurs in these transitional areas than in either marsh or upland areas. Wildlife that usually inhabit marshes move into these transitional areas during high tides and periods of seasonal flooding. Thus, these areas are very important to the entire estuarine system and must be considered important wildlife resources. Exhibit 8 describes the biological resources of the site in detail.

The portion of the site within the "bay" jurisdiction of BCDC that would be filled by the proposed power plant is shown in Exhibit 5. No

information has been submitted to determine whether the standards noted above concerning alternative locations and minimizing fill would be complied with.

c. Endangered Species. The endangered salt marsh harvest mouse has been found throughout much of PG&E's property and on the site itself. PG&E consultants estimate that up to 8.4 acres of marsh habitat capable of supporting the mouse will be directly lost due to construction of the plant, but additional studies are being conducted. Because of the limited information now available, no estimate was made of operating impacts of the power plant on its habitat such as cooling tower drift and noise.

Four plant species that have been identified by the California Native Plant Society as rare or endangered have also been found on parts of PG&E's property, one located directly north of the power generating units in the marsh. Although the power plant design does not envision construction in the area that the species was found, no information has been presented on whether operating impacts of the power plant, such as cooling tower drift, would adversely affect the species.

d. Mitigation. PG&E has asserted that compliance with BCDC and other state and federal policies concerning the protection of marshes, wetlands, endangered species, and other wildlife resources will be accomplished through the development of a marsh mitigation/management plan. No information about that plan has been submitted by PG&E and the company proposes to prepare it later in the NOI proceedings. There has been no indication that alternative locations for the plant, either within PG&E's 3-mile-long property or elsewhere, will be considered in that plan.

3. Cooling System. The proposed power plant will use evaporative, mechanical draft cooling towers with water drawn from the confluence of the Sacramento River and Suisun Bay. As combined cycle power plants are more efficient than ordinary steam turbines, the amount of cooling water drawn from the Bay is less than that required for the same amount of electricity generated by a conventional steam turbine such as that proposed at Collinsville. The amount of water required is about 40 cubic feet-second (as compared with about 70 cubic feet-second for the Fossil 1 and 2 units) and about 27 cubic feet-second will be discharged into the Bay as blowdown. Although the impacts caused by this cooling system will therefore be less than those from Fossil 1 and 2, they must still be evaluated.

Based on comments from the Regional Water Quality Control Board staff, it appears likely that the discharge from the proposed plant will be able to comply with the thermal discharge standards established by the state. Entrainment of marine organisms in the cooling system is likely to present greater difficulties. Opposum shrimp and juvenile striped bass are known to concentrate in the Pittsburg-Antioch area. These organisms and the larval forms of other aquatic species will be entrained in the cooling system and the mortality rate is extremely high.

As proposed in the NOI, the intake for the cooling system would be located in the Harris Yacht Harbor slough. Juvenile and larval forms of aquatic organisms are likely to be attracted to these quiet waters and their mortality rate will consequently be higher. An alternative location for the intake system would be in the Bay. It is likely that this alternative, however, would involve the disturbance of more marsh.

PG&E has asserted that the final design of the intake and discharge structures will not be determined until after future studies are completed to determine compliance with water quality standards. PG&E has also asserted that there are no practical alternatives to using Bay water for cooling because the Contra Costa County Water District has stated that it desires to reserve its better quality effluent from waste water treatment plants for other industrial users who do not have access to Bay water. Thus, there do not appear to be any practical alternatives to the use of Bay water for the cooling system at this location. The issue is, therefore, whether the proposed system will have unacceptable impacts or whether the adverse effects that it will have can be fully mitigated. The extent of the effects will not be determined, however, until future studies are completed.

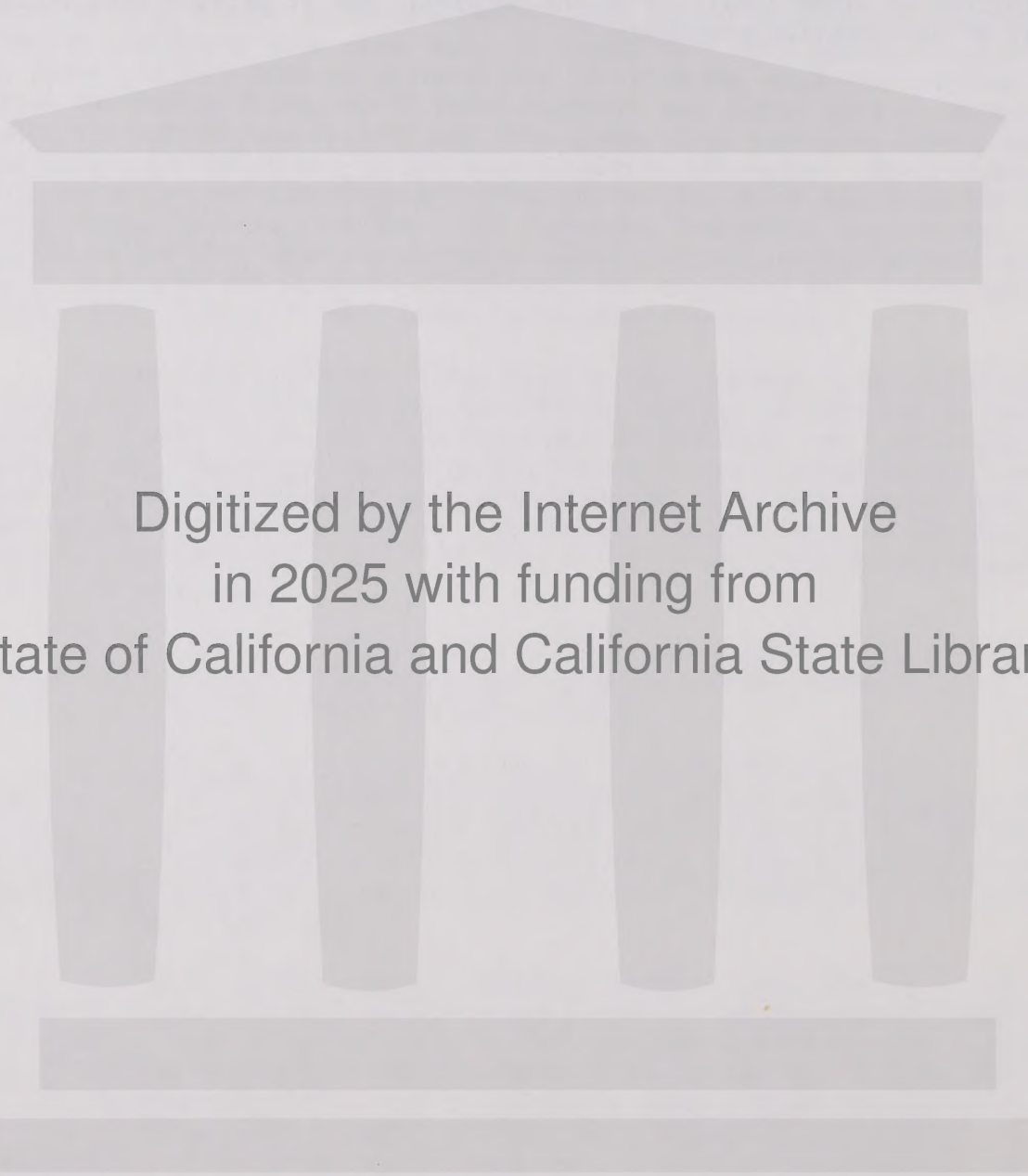
The information that is available on the increase in salinity caused by the operation of the proposed plant during periods of low flow is the same as that submitted during the Fossil 1 and 2 proceedings. As this plant is more efficient than Fossil 1 and 2, the amount of water evaporated is less (about 13 cubic feet-second evaporated versus 30 cubic feet-second) and therefore the impacts are reduced accordingly. Exhibit 9 shows the estimated effects of the plant on salinity by itself and in conjunction with Fossil 1 and 2 in selected areas.

The NOI does not contain any information on whether this is the only location that possesses riparian water rights or whether there is the potential to acquire appropriated water rights.

4. Public Access and Scenic Views. The Bay Plan and the McAteer-Petris Act require that maximum feasible public access be provided in any project. No provision has been made for public access in the NOI except that PG&E has stated that it will develop a public access plan as part of its marsh mitigation/management plan. That plan will presumably be developed later in the NOI proceedings.

Part of public access, however, is the visual quality of the experience. Visual impacts are also dealt with in the Bay Plan Policies on Scenic Views. Those policies require that maximum efforts be made to preserve views of the Bay from public areas (Scenic Views Policy No. 1, page 33), and that developments should be built in clusters (Scenic Views Policy No. 2, page 33). The proposed site is highly visible from Highway 4, the major transportation route along the northern part of Contra Costa County. By separating the proposed plant from the existing PG&E power plants at Pittsburg by about 2.5 miles, the visual impact of the plant will be much greater than if it was located closer to the existing facilities. No evaluation of the visual impacts of alternative locations has been provided.

5. Local Plans. Although identified as the Pittsburgh units, all of the PG&E property is under County jurisdiction. The County's General Plan for the area is shown in Exhibit 10. Both the proposed location of the plant and other areas of the PG&E property are identified as industrial. County noise standards may also effect the location and design of the plant because there are existing residential uses near much of the PG&E property. No information has been submitted on whether the plant could comply with County noise regulations at other locations on the property, but it appears that it can comply at the location proposed.



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II. PROPOSED FINDINGS

A. Consistency with Bay Plan and McAteer-Petris Act. As proposed in the NOI, the power plant is inconsistent with the Bay Plan and the McAteer-Petris Act for the following reasons:

1. The site is reserved for water-related industry on the Bay Plan and this power plant is not a water-related industry.

2. The proposed location for the power plant would require fill within the "bay" jurisdiction of BCDC and fill within a marsh. Fill in such areas requires compliance with the following standards and policies and that compliance has not been demonstrated:

a. "...fill in the bay for any purpose, should be authorized only when no alternative upland location is available for such purpose" (Government Code Section 66605(b));

b. "...the water area authorized to be filled should be the minimum necessary to achieve the purpose of the fill" (Government Code Section 66605(c));

c. "...the nature, location and extent of any fill should be such that it will minimize harmful effects to the bay area, such as...water quality, fertility of marshes or fish or wildlife resources" (Government Code Section 66605(d));

d. "Specific habitats that are needed to prevent the extinction of any species...should be protected, whether in the Bay or on the shoreline behind dikes." (Bay Plan Fish and Wildlife Policy No. 2, page 9.)

e. "Marshes...should be maintained to the fullest possible extent to conserve fish and wildlife...Filling and diking that eliminate marshes...should therefore be allowed only for purposes providing substantial public benefits and only if there is no reasonable alternative." (Bay Plan Marshes and Mudflats Policy No. 1, page 11.)

f. "...maximum feasible opportunity for pedestrian access to the waterfront should be included in every new development in the Bay or on the shoreline..." (Bay Plan Public Access Policy No. 1, page 29.)

g. "Maximum efforts should be made to provide, enhance, or preserve views of the Bay from public areas." (Bay Plan Scenic Views Policy No. 1, page 33.)

h. "Shoreline developments should be built in clusters, leaving open area around them, to permit more frequent views of the Bay." (Bay Plan Scenic Views Policy No. 2, page 33.)

B. Conditions. The project cannot be modified to make it consistent with the Bay Plan and the McAteer-Petris Act because it is a use of this site that is inconsistent with the priority use designations in the Bay Plan.

In conclusion, the Commission wishes to point out that power plants are recognized as a water-oriented use under the McAteer-Petris Act for which some necessary fill may be approved. The Bay Plan policy on power plants states that they "may be located in any area where they do not interfere with and are not incompatible with residential, recreational, or other public uses of the Bay and shoreline, provided that any pollution problems resulting from the discharge of large amounts of heated brine into Bay waters, and water vapor into the atmosphere, can be precluded" (Other Uses of the Bay and Shoreline Policy No. 8, page 29). However, before fill in marshes, a particularly valuable habitat, or in the Bay can be allowed for any use, including power plants, it must be conclusively shown that there is no alternative upland location for the project that does not require fill, and that any fill is the minimum amount necessary. PG&E has failed to demonstrate that the fill involved in the proposed Pittsburgh 8 & 9 project is necessary, is the minimum amount, or that there is no alternative upland location for the project. Moreover, the use is inconsistent with the water-related industrial designation of the site. The Commission would be pleased to work with PG&E and the Energy Commission if additional information is developed in the future which bears on these issues.

EXHIBITS



SOLANO CO
CONTRA COSTA CO

S U I S U N

PG&E PROPERTY LINE

WEST PITTSBURG

SACRAMENTO

SAN JOAQUIN

WILLOW PASS

TRAILER PARK

RAILROAD

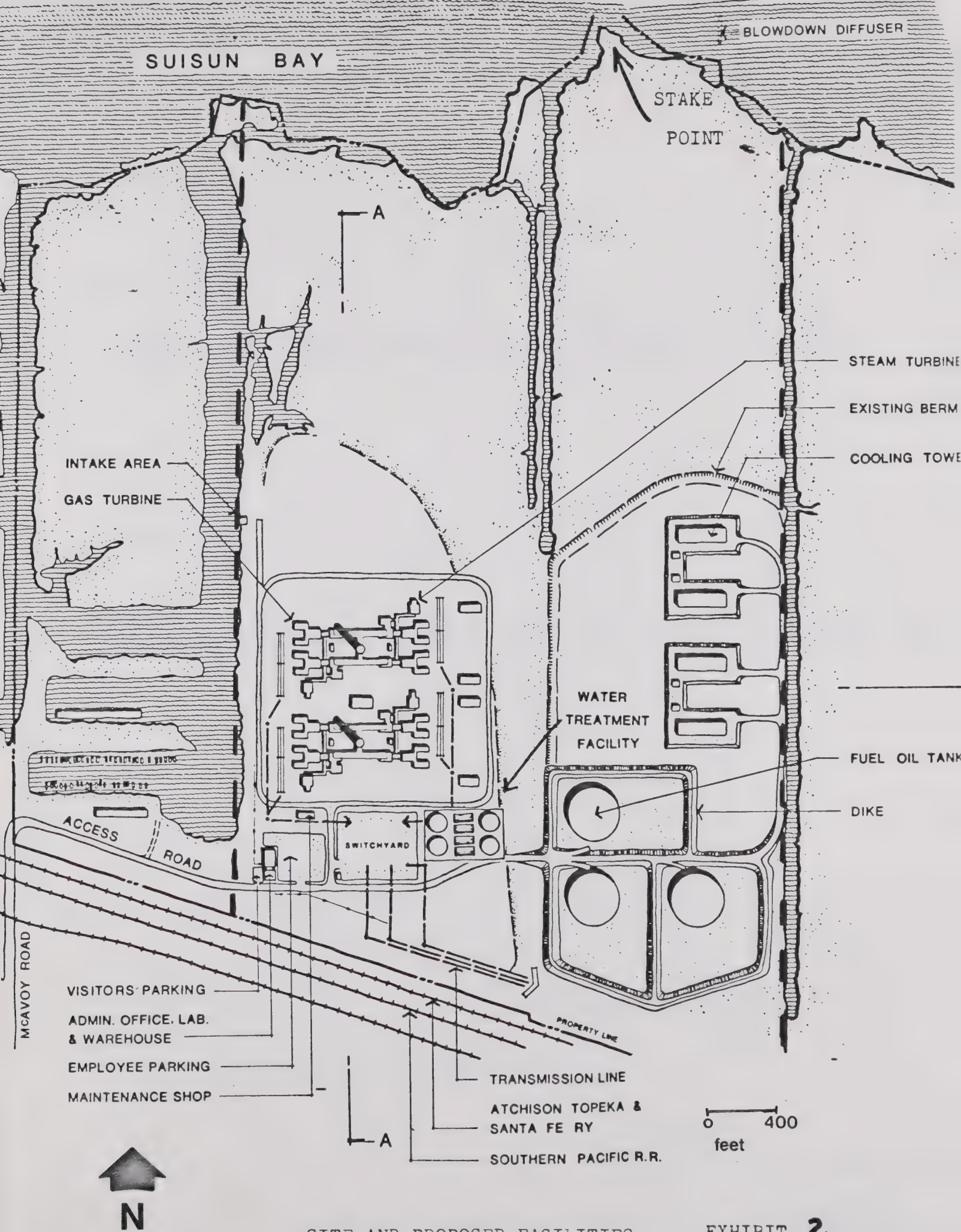
WATER TANK

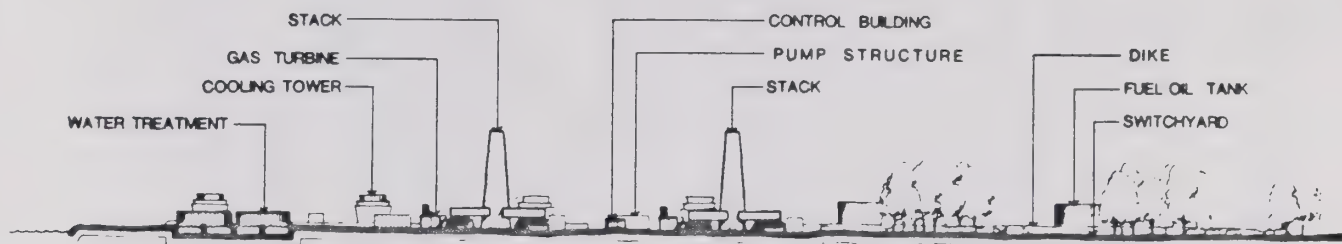
BEACONS

PROJECT

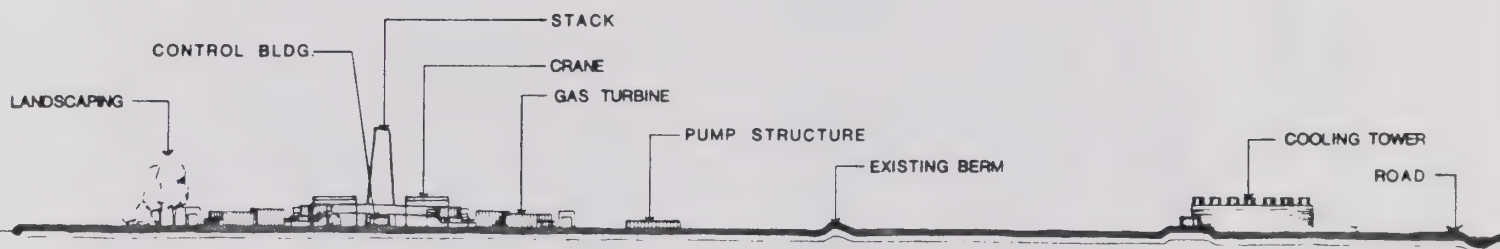
SITE

EXHIBIT 1





SECTION A-A



SECTION B-B

Site Sections

PITTSBURG UNITS 8 & 9



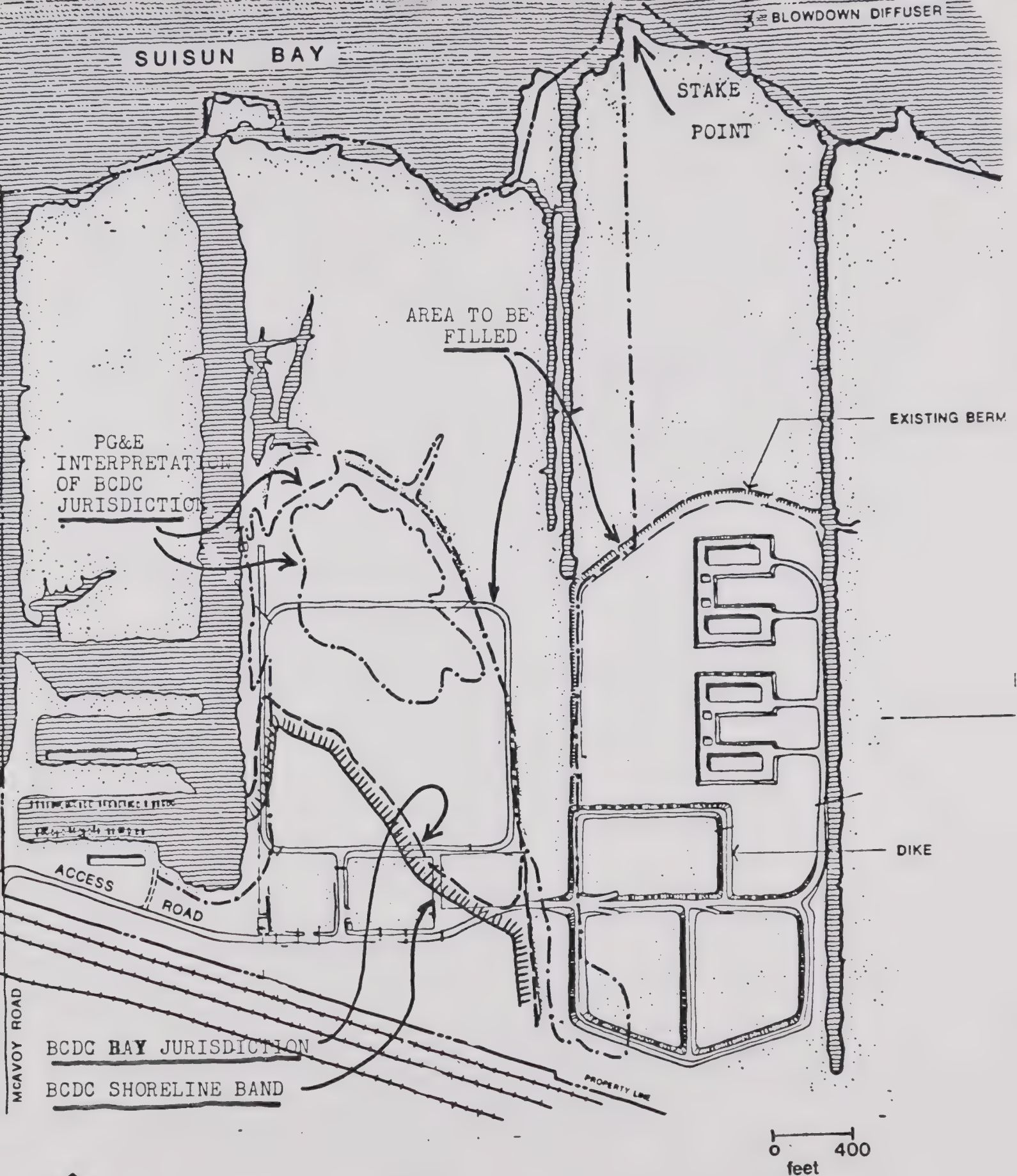
FIGURE 3.2-3

EXHIBIT **3**



ARCHITECTS RENDERING OF PROPOSED FACILITIES
PITTSBURG UNITS 8 & 9

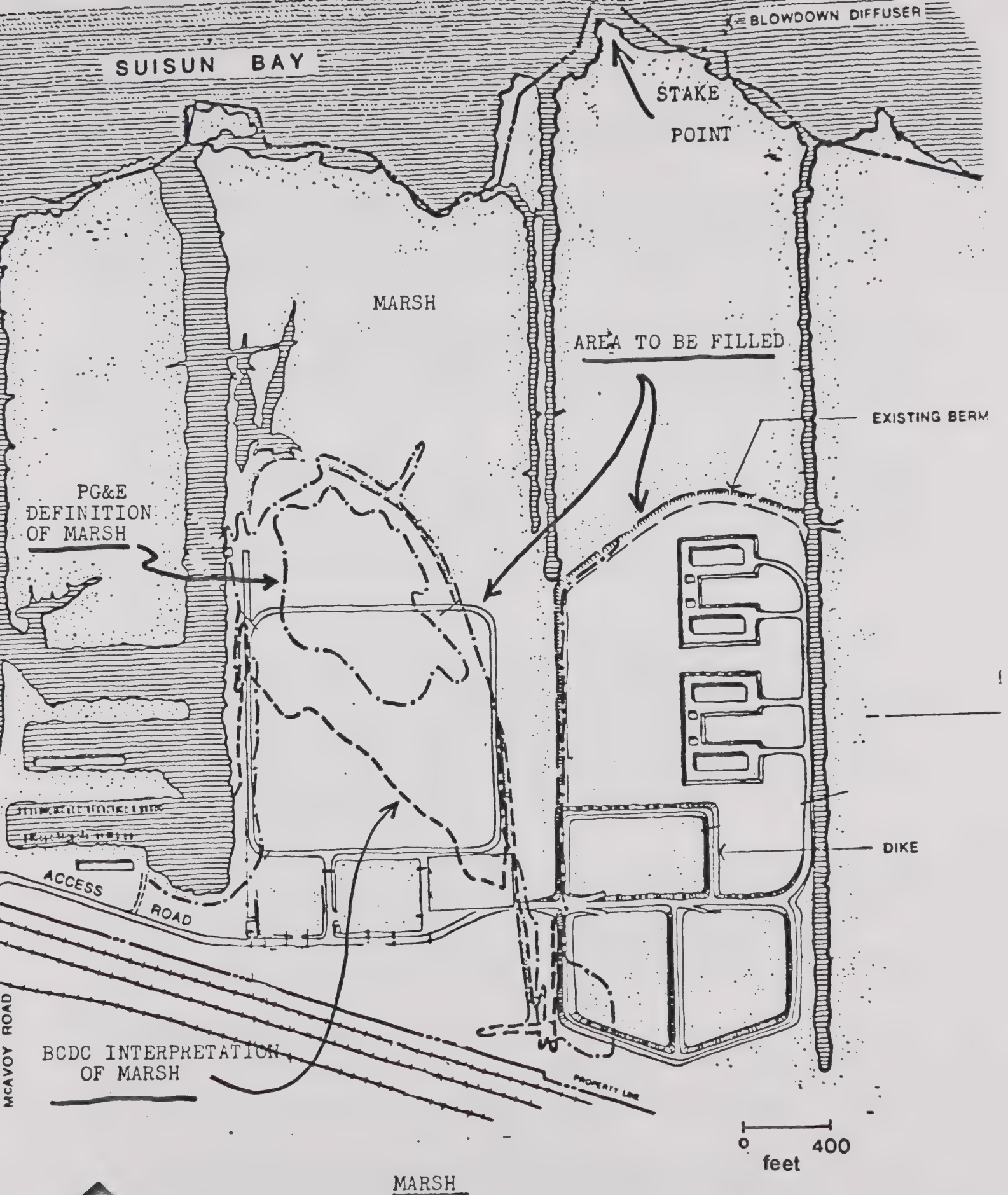
FIGURE 3.2-1



BCDC JURISDICTION

(Larger, more accurate maps will be available at the Commission meeting)

EXHIBIT 5



(Larger, more accurate maps will be
available at the Commission Meeting)

EXHIBIT **6**

TO THE FILES:

This memorandum pertains to the determination of BCDC jurisdiction for any point on the Bay and speaks specifically to BCDC jurisdiction at PG&E's Pittsburgh 8 and 9 project site.

The San Francisco Bay is defined in Government Code Section 66610(a) as ". . . all areas that are subject to tidal action. . ." (from the McAteer-Petris Act), and is further defined by the Commission's Regulations as "...touched by tidal waters at any stage of the tide at the time on or subsequent to September 17, 1965..." (California Administrative Code Section 10132(a)).

Historical tide records at long term guages can be used to estimate the highest tide at other locations. The highest tides ever recorded were during January, 1973, at which time the tide reached 8.4 feet above Mean Lower Low Water (MLLW) at Fort Point. The difference between the highest tide and Mean Higher High Water (MHHW) can be adjusted by published variations in the rise (or fall) of the tide in the Bay for any other point.

An index map attached to Tidal Bench mark data, published by the U.S. Department of Commerce, Coast and Geodetic Survey, indicates the locations for which tidal bench mark data are available in San Francisco Bay. The Pittsburgh 8 and 9 Project site lies between the bench marks numbered 30 and 31, referred to as Port Chicago, Suisun Bay and Mallard Ferry Wharf, Suisun Bay respectively. I have used both of these points to independently calculate tidal elevations.

#30-Port Chicago, Bay Point, Suisun Bay

The first step in calculating the tidal elevation at Port Chicago is to determine the incremental difference between the highest tide recorded at Fort Point and the MHHW at Fort Point and adjust this difference by published (U.S. Dept. of Commerce Tide Tables) variations in the rise (or fall) of the tide in the Bay for any other point. The adjustment to high tides given in the Pacific Coast Tide Tables for Port Chicago area is 0.2 feet below the high tide elevation at Fort Point. The adjusted difference between highest tide and MHHW at Fort Point adjusted to high tide for Port Chicago is: $8.4 - 5.9 - 0.2 = 2.3$ feet above MHHW.

The next step is to add the adjusted difference to the Port Chicago MHHW and to convert that elevation from MLLW datum to sea-level datum of 1929 (SLD). The MHHW elevation for Port Chicago and the difference between SLD and MLLW datum is given in the U.S. Department of Commerce, National Ocean Survey publication of tidal bench marks in California Region III. The Estimated Highest Recorded Tide is calculated to be $2.3 + 5.4 = 7.7$ feet on MLLW datum, and converted to SLD it is $7.7 - 2.2 = 5.5$ feet.

#31-Mallard Ferry Wharf

The first step is the same as for Port Chicago: 2.3 feet above MHHW.

The Estimated Highest Recorded Tide is: $2.3 + 4.7 = 7.0$ feet on MLLW datum, and converted to SLD is $7.0 - 1.5 = 5.5$ feet.

As both #30 and #31 are the same, BCDC jurisdiction at the PG&E Pittsburgh 8 and 9 project site should be considered to be at 5.5 feet SLD, 1929.

Norris H. Millikin
Senior Engineer

My name is James A. Brownell. I am a Staff Biologist for the Environ-
mental and Health Office of the California Energy Commission. A resume of
my professional qualifications is attached to this testimony as "Appendix A".

The methods used during my analysis include: site visits; review of project documents including the PG&E Notice of Intention, interrogatories and answers, letters and comments received by the Secretariat's Office; workshops and meetings and phone conversations with other biologists to discuss the site and alternatives.

EXHIBIT 8

Summary

A major portion of the Pittsburg 8 and 9 site is a wetland which supports characteristic vegetation and wildlife. A state and federally recognized endangered species, the Salt Marsh Harvest Mouse, is found on the site and the adjacent wetlands. State and federal policies and regulations have been designed to protect against loss of wetlands and to conserve the habitat of endangered animal species. Based on these policies and regulations I conclude that from the standpoint of biological resources, the proposed Pittsburg 8 & 9 site is unacceptable. In order for the site to be developed the applicant will have to show:

- (1) that the site is compatible with state and federal policies and standards,
- (2) there is no alternative to the project which is less environmentally damaging, and
- (3) an acceptable plan can be developed to compensate for wetland losses and any adverse impacts on endangered species and their habitats.

EXHIBIT **8** CONTINUED

1 Wetlands

2 The proposed site is adjacent to Suisun Bay and historically was a
3 part of the marsh and estuarine environment of the Bay (NOI, pg. 4-14).

4 The existing site supports vegetation and wildlife characteristic
5 of wetland habitats even though the area has been altered by diking, depo-
6 sition of dredge material, and the grazing of cattle. In the NOI (pg. 4-26,
7 Figure 4.4-7) five ground cover types are described for the site. Most of
8 these areas should be classified as wetlands even though the normal grada-
9 tion of wetland vegetation from tidal marsh to upland grasses cannot be
10 observed because of the disturbance. Opening up of the existing dikes would
11 allow periodic flooding and result in the enhancement of this valuable marsh
12 environment. Development of a power plant on this site will foreclose this
13 option.

14 Plant communities and certain plant species are indicators of wetland
15 areas and are used as a guide in determining the extent of marsh habitat
16 (Corps of Engineers, 1978). On-site the five ground cover types are tidal
17 marsh, grazed upland pasture, seasonally flooded pasture, ruderal communities,
18 and the industrial waste site. Tules (Scirpus sp.), cattails (Typha sp.),
19 and pickleweed (Salicornia sp.) located on-site are typical of tidal marsh
20 in wetland areas subject to frequent flooding. As this tidal marsh vegeta-
21 tion extends into the center and south end of the site it changes slightly
22 and is dominated by dense stands of pickleweed and saltgrass (Distichlis sp.)
23 which are associated with less frequent flooding but still wet and saline
24 soil conditions. The Salt Marsh Harvest Mouse was found on-site in the less
25 frequently flooded portions of the tidal marsh.

26 On the western side of the site a low levee curves around the seasonally
27 flooded pasture and separates it from the tidal marsh on the other side.

1 The pickleweed found in the seasonally flooded pasture is less dense and is
2 gradually replaced by brass buttons (Cotula coronopitifolia) on the higher
3 areas. Both the pickleweed and brass buttons are considered as indicator
4 species of salt marsh wetland conditions when found in locations altered by
5 diked areas as found on this site. The Salt Marsh Harvest Mouse population
6 was found to extend into the seasonally flooded pasture.

7 The brass buttons extend from the seasonally flooded pasture on to the
8 larger area of grazed upland pasture. As the fill elevation approaches the
9 level on which the ranch facilities are located the abundance of brass
10 buttons decreases. Because of the heavy grazing and disturbance of soil
11 by the cattle in this area, vegetation does not provide an adequate indica-
12 tion of the wetland area. Determination of the full extent of wetland in
13 the grazed upland pasture would require consideration of other than biolo-
14 gical characteristics, such as, the elevation of the fill in conjunction
15 with local tidal characteristics, soil salinity and soil moisture regime.

16 The industrial deposition site which is being used as a wastewater
17 evaporation pond also contains wetland vegetation, tules, pickleweed, and
18 brass buttons. Waterfowl and shore birds have been observed using this pond
19 (PG&E, 1978b). The water quality of the pond is poorer than the adjacent
20 tidal slough. However, laboratory bioassay studies using water from the
21 pond showed 100% survival during a 96 hour tolerance test on the threespine
22 stickleback (Gasterosteus aculeatus) (PG&E, 1978a). These results suggest
23 that the water would not be toxic to waterfowl and shore birds observed at
24 the pond.

25 In letters to the Commission, both the U.S. Fish and Wildlife Service
26 (USFWS, 1978) and the California Department of Fish and Game (CDFG, 1978)
27 industrial waste disposal agree that the site should be considered as a seasonally flooded wetland

1 containing marsh species of vegetation. Both agencies also recognize that
2 the industrial deposition site should be evaluated for its value as a
3 wetland.

4 The vegetation around the ranch facilities, along the railroad right-
5 of-ways, and on top of the higher dikes are characteristic of disturbed
6 upland vegetation, identified as ruderal communities (NOI, pg. 4-27).

7 Upland areas such as this are important to wetland habitats for they func-
8 tion as areas of protection and escape for marsh wildlife during periods
9 when the wetlands are flooded. Preservation of upland areas adjacent to
10 marshes is important to the quality of the wetland environment.

11 My estimate is that approximately 86% of the site is wetland and that
12 there will be a direct loss of at least ¹⁵¹~~175~~ acres of wetland if the site
13 is developed. This does not include the loss of the important upland areas.
14 Based on Figure 4.4-7 (NOI, pg. 4-26) my rough estimate of the on-site
15 ground cover is 45% tidal marsh, 17% grazed upland pasture, 8% seasonally
16 flooded pasture, 6% ruderal community, and 24% industrial deposition site.
17 I have included all of the tidal marsh, seasonally flooded pasture, and
18 industrial pond as wetland. From field observations of the extent of brass
19 buttons I estimated slightly over half of the grazed upland pasture is wet-
20 land (9% of the total project site area). The remaining 8% of the site
21 area classified as grazed upland pasture and all of the ruderal community
22 were not included as wetland. Since approximately 200 acres of the 350
23 acre site would be developed and the ^{14%}~~12%~~ that is not wetland or ⁴⁹~~12~~ acres is
24 within the 200 acres there would be a loss of at least ¹⁵¹~~175~~ acres of wetland
25 from fill associated with site development. Staff has requested the appli-
26 cant to provide a more precise map of the wetland acreage (CEC, 1978, pg. 17,
27 #5). This information has not yet been provided.

Protection of the wetlands in California and nationwide is extremely important as reflected by state and federal policies, laws and regulations to protect the remaining areas. Approximately 90% of the wetlands originally existing in California have been lost due to draining, dredging, and filling (USFWS, 1977). Over 65% of the wetlands in the San Francisco Bay area have been lost (EDAW, 1974). Wetlands are a vital part of the California's marine ecosystem and the migratory bird flyways. They provide food and habitat for aquatic organisms, such as fish, and resting and feeding areas for shore birds and waterfowl. Alteration and/or destruction of wetlands adversely affects these resources by lowering or eliminating productivity and thus can ultimately impact the human food chain. As discussed above, construction of Pittsburg 8 and 9 would result in substantial destruction of wetlands.

In areas where there would be an impact on or loss of wetlands, state and federal policies require that there must be no feasible, less environmentally damaging alternative location for the project and that adequate compensation for project-caused losses shall be provided by project proponents.

The State Resources Agency has stated that:

"It is the basic policy of the Resources Agency that this Agency and its Departments, Boards and Commissions will not authorize or approve projects that fill or otherwise harm or destroy coastal, estuarine, or inland wetlands.

Exceptions to this policy may be granted provided that the following conditions are met.

- (1) The proposed project must be water dependent or an essential transportation, water conveyance or utility project.
- (2) There must be no feasible, less environmentally damaging alternative location for the type of project being considered.
- (3) The public trust must not be adversely affected.

(4) Adequate compensation for project-caused losses shall be a part of the project. Compensation, to be considered adequate, must meet the following criteria:

- (a) The compensation measures must be in writing in the form of either conditions on a permit or an agreement signed by the applicant and the Department of Fish and Game or the Resources Agency.
- (b) The combined long-term wetlands habitat value of the lands involved (including project and mitigation lands) must not be less after project completion than the combined wetlands habitat value that exists under preproject conditions."

California Resources Agency, "Policy for Preservation of Wetlands in Perpetuity," September 19, 1977.

Regulations of the U.S. Environmental Protection Agency state that:

"From a national perspective, the degradation or destruction of aquatic resources by filling operations in wetlands is considered the most severe environmental impact covered by these guidelines.... Discharges of fill material shall not be permitted unless the applicant clearly demonstrates the following:

- (a) The activity associated with the fill must have direct access or proximity to, or be located in, the water resources in order to fulfill its basic purpose, or that other site or construction alternatives are not practicable; and
- (b) That the proposed fill and the activity associated with it will not cause a permanent unacceptable disruption to the beneficial water quality uses of the affected aquatic ecosystem, or that the discharge is part of an approved federal program which will protect or enhance the value of the wetlands to the ecosystem."

40 CFR Sections 230.4-1(a)(1), 230.5(b)(8)(ii)

These regulations are applicable because PG&E intends to deposit fill on the Wetlands at the site. A federal permit from the Army Corps of Engineers is required. 33 U.S.C.A. Section 1344(a), 33 CFR Section 209.120(2)(b), 40 CFR Section 230.1.

The applicant has not demonstrated that the proposed project will comply with these standards and policies. It is Staff's position that for the development of the site to proceed PG&E must show that:

- (1) the site is compatible with state and federal wetland policies and standards,
- (2) there is no alternative to the project which is less environmentally damaging to wetlands, and
- (3) an acceptable plan can be developed to compensate for wetland losses.

Staff has solicited information from the Company which would indicate their plans and ability to comply with these concerns, but PG&E has not yet provided this information.

PG&E is developing a master plan for marsh mitigation (MOI, pg 9-5). The proposal to develop the plan was to be presented to Company management in September 1978. If the proposal is approved by management, PG&E plans to hold meetings with USFWS and CDFG this fall to discuss development of a compensation plan.

Since it is technically feasible to compensate for wetland losses by establishing an equivalent value new wetland there is a possibility that PG&E can compensate for on-site losses. However, such a plan may affect the economic acceptability of the power plant development. In order for the Commission to determine that Pittsburg 8 and 9 is acceptable, PG&E must make its master plan available for review in time so that both the economic and biological acceptability of compensation, and compliance with federal and state policies and regulations, can be determined prior to or during the second set of hearings.

EXHIBIT 8 CONTINUED

1 Salt Marsh Harvest Mouse

2 During recent studies conducted for PG&E by Western Environmental
3 Services Company (WESCO), the Salt Marsh Harvest Mouse (Reithrodontomys
4 raviventris halicostes) was trapped on the proposed site and in the area
5 between the proposed site and existing Units 1-7. The Salt Marsh Harvest
6 Mouse has been declared an "endangered" animal species by both federal and
7 state law. California Fish and Game Code Section 2052, 14 California
8 Administrative Code, Section 670.5(a)(2); Endangered Species Act of 1973,
9 Pub. L. 93-205, Section 4, 16 U.S.C.A. Section 1533(c)(1), 50 CFR Section
10 17.11(i). State and federal policies have been adopted to conserve en-
11 dangered species and their habitats. These species are recognized as being
12 of esthetic, ecological, educational, historical, recreational, and scien-
13 tific value. Publ. L. 93-205, Section 2, 16 U.S.C.A. Section 1531(3).
14 The continual destruction of salt marsh habitat by bay fill and diking
15 are major factors contributing to the decline of the Salt Marsh Harvest
16 Mouse (CDFG, 1976).

17 Federal law is applicable to this project in three ways. First,
18 regulations provides that no person shall take or harm any endangered species.
19 16 U.S.C.A. Sections 1532(14), 1538(a)(1)(B). "Harm" means "an act or omission
20 which actually injures or kills wildlife, including acts which annoy it to
21 such an extent as to significantly disrupt essential behavioral patterns,
22 which include but are not limited to, breeding, feeding, or sheltering;
23 significant environmental modification or degradation which has such effects
24 is included within this meaning of 'harm' [.]" 50 CFR Section 17.3. In
25 addition, federal agencies are required to take such actions as necessary
26 to ensure that actions authorized by them do not jeopardize the continued
27 existence of endangered species or result in the destruction or modification

1 of habitat which is determined to be critical. Pub. L. 93-205, Section 7;
2 16 U.S.C.A. Section 1536. Finally, in situations where fill will be placed
3 on wetlands, federal regulations state that:

4 "No discharge will be allowed that will jeopardize the continued
5 existence of threatened or endangered species or destroy or modi-
6 fy the habitat of those species determined critical in accordance
7 with the Endangered Species Act."

8 40 CFR Section 230.5(b)(6).

9 Since filling of salt marsh habitat, such as, the on-site wetland
10 habitat where the Salt Marsh Harvest Mouse has been found, has contributed
11 to the decline of this species in the past, it is likely that the additional
12 loss of habitat on the proposed site, caused by the filling required to de-
13 velop the power plant, will jeopardize the continued existence of this spe-
14 cies. Such action would disrupt the species breeding, feeding, and shelter
15 areas by destroying on-site habitat. In addition, habitat may be adversely
16 affected by cooling tower drift.

17 Statements by the U.S. Fish and Wildlife Service indicate that all
18 known locations of this species are under consideration as Critical Habitat.
19 The determination is expected in July 1979. If the site is designated as
20 Critical Habitat, this may make compensation for on-site habitat losses
21 more difficult to achieve.

22 Staff's position is that the project is unacceptable unless PG&E shows
23 that full compensation will be provided for loss of any habitat used by the
24 Salt Marsh Harvest Mouse, both on and off-site. In addition, PG&E must
25 show that construction and operation of the facility will not harm the spe-
26 cies. These showings must be made by the second set of hearings. PG&E
27 should address these subjects in its master plan for marsh mitigation.

EXHIBIT 8 CONTINUED

1 Compensation by establishing a new marsh and moving the existing
2 on-site Salt Marsh Harvest Mouse population to the new location is possible.
3 It is likely that a newly created marsh for this purpose would have to be
4 in the near vicinity of the existing location.
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EXHIBIT 8 (END)

Estimated Range of TDS Increases, mg/l
1976 Conditions

Location	Montezuma 1 and 2	Pittsburg 8 and 9	Both Plants Combined
Emmaton	0-21	0-7	1-27
Jersey Point to Antioch Bridge	2-23	1-9	3-31
Antioch Bridge to City of Antioch	1-33	0-13	4-45
Collinsville	5-53	2-20	10-72
Chipp's Island	8-60	4-28	17-87
Port Chicago	28-80	12-30	59-110

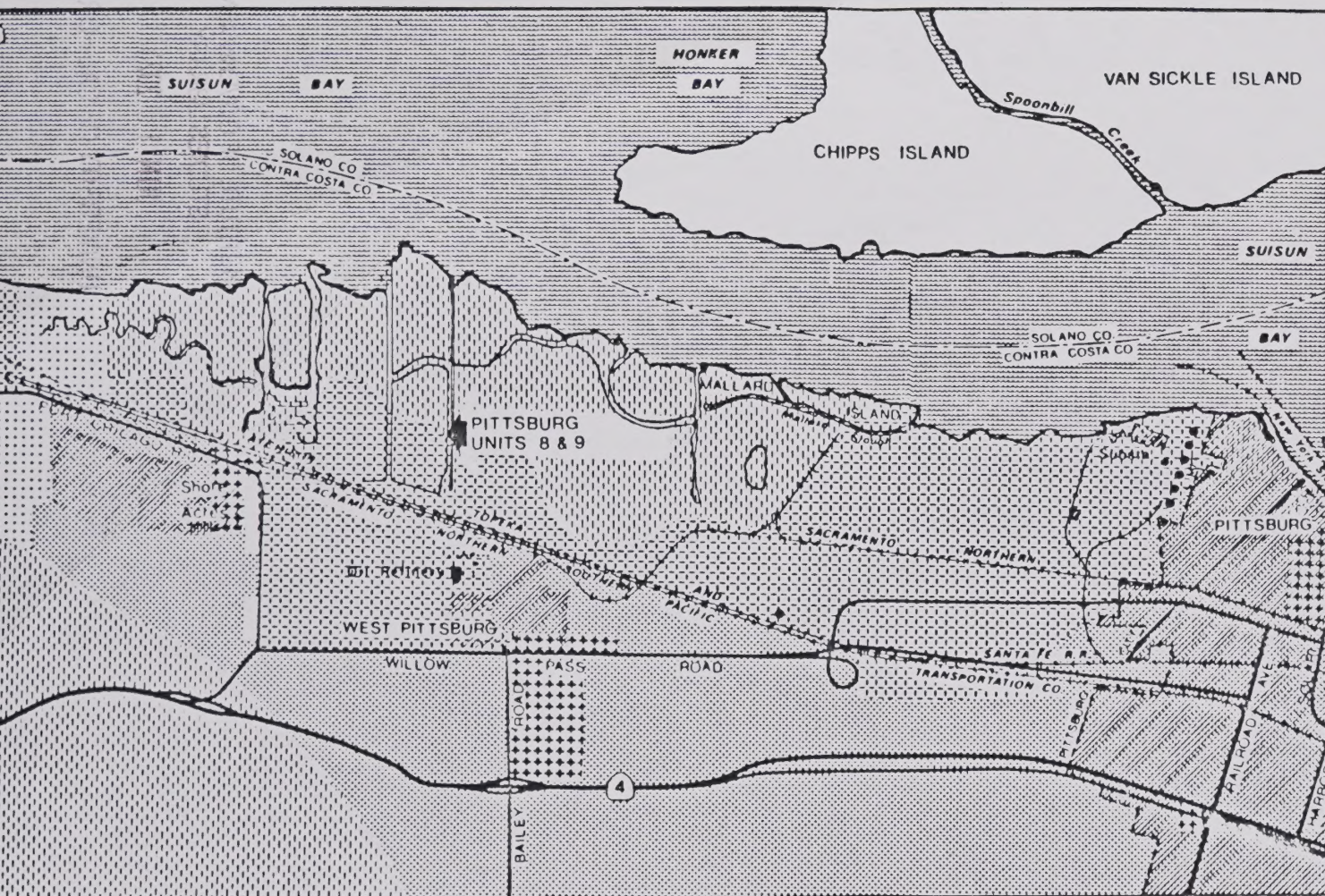
The calculated TDS effects have been translated into chloride concentration effects using conversion equations based on field observations. The range of estimated effects of the developments under 1976 conditions is summarized in terms of chloride concentrations as follows:

Estimated Range of Chloride Increases, mg/l
1976 Conditions






Location	Montezuma 1 and 2	Pittsburg 8 and 9	Both Plants Combined
Emmaton	0-11	0-4	0-13
Jersey Point to Antioch Bridge	1-13	1-5	2-17
Antioch Bridge to City of Antioch	0-18	0-7	2-24
Collinsville	3-33	1-12	6-44
Chipp's Island	3-31	2-15	8-45
Port Chicago	15-45	6-17	22-62

(Computer model prepared by Hydrosience, Inc., July 1978. Model assumes complete mixing over segments of Suisun Bay and the Delta that are about 3-4 miles long. Complete text of study sent to the Commission during Fossil 1 and 2 hearing.)

PITTSBURG UNITS 8 & 9 Generalized County General Plan



legend

-  Commercial
-  Heavy Industrial
-  Residential
-  Open Space/Agriculture
-  Public/Semi-Public

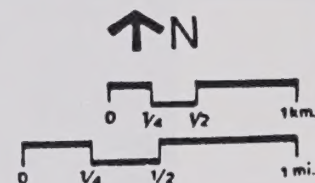


FIGURE 4.4-38

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